

# **SUSPENSION DEVICE FOR A TOOL HANDLE**

## **BACKGROUND OF THE INVENTION**

### **1. Field of the Invention**

The invention relates to a suspension device for a tool handle, and particularly to a suspension device that directly clamps the handle to suspend the tool.

### **2. Description of Related Art**

Multiple tools with long handles, such as brooms, mops, rakes, shovels and the like, are usually stored by hanging them handle down or by a ring attached to a distal end of the handle. The ring is looped on a hook attached high on a wall because the handles are long. However, looping the ring on a hook high on a wall is difficult and inconvenient. Additionally, the hooks are attached securely to the wall so that distances between tools cannot be adjusted.

The present invention has arisen to provide a suspension device for a tool handle to overcome the drawbacks of conventional fixtures to store tools with handles.

## **SUMMARY OF THE INVENTION**

A main objective of the present invention is to provide a suspension device for a tool handle, which directly clamps the tool handle.

Further benefits and advantages of the present invention will become apparent after a careful reading of the detailed description in accordance with the drawings.

## **BRIEF DESCRIPTION OF THE DRAWINGS**

1           Fig. 1 is a perspective view of a suspension device for a tool handle  
2   in accordance with the present invention;

3           Fig. 2 is an exploded perspective view of the suspension device for a  
4   tool handle in Fig. 1;

5           Fig. 3 is a cross-sectional top plane view of the suspension device for  
6   a tool handle in Fig. 1;

7           Fig. 4 is an operational cross-sectional top plane view of the  
8   suspension device for a tool handle in Fig. 1 with a tool handle pressed into a  
9   handle recess in a base and clamped by an outer face on an elastic bracket  
10   within the handle recess;

11          Fig. 5 is an operational perspective view of multiple suspension  
12   devices in Fig. 1 attached to a surface by hooks; and

13          Fig. 6 is an operational perspective view of another embodiment of  
14   multiple suspension devices in accordance with the present invention,  
15   wherein the suspension devices slidably mounted in a track.

#### 16   DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

17          A suspension device for a tool handle in accordance with the present  
18   invention comprises a base with a handle recess and an elastic bracket  
19   mounted on the base in front of the handle recess.

20          With reference to Figs. 1 and 2, a preferred embodiment of the  
21   suspension device in accordance with the present invention comprises a  
22   hollow body (10), an elastic bracket (20), two rollers (24) and two pivot pins  
23   (25).

24          The hollow body (10) has a back plate (11), two braces (not

1 numbered), a top bracket (not numbered), a bottom bracket (not numbered),  
2 two roller spaces (16) and two optional hooks (12).

3 The back plate (11) is rectangular and has a top edge (not numbered),  
4 a bottom edge (not numbered), two ends (not numbered), a front surface (not  
5 numbered), and a rear surface (not numbered). The front surface has a top lip  
6 (not numbered) and a bottom lip (not numbered). The top lip is formed along  
7 the top edge, and the bottom lip is formed along the bottom edge.

8 The two braces extend from the front surface of the back plate (11)  
9 respectively at the two ends, and each brace has a top edge (not numbered)  
10 and a bottom edge (not numbered).

11 The top bracket has a front end (not numbered), two side edges (not  
12 numbered), a U-shaped recess (13), two ears (14) and two pivot pin holes  
13 (15), extends from the back plate (11) near the top edge and forms the top lip  
14 on the front surface of the back plate (11). The side edges of the top bracket  
15 are connected respectively to the top edges of the two braces. The U-shaped  
16 recess (13) is formed in the front end and forms the ears (14) respectively on  
17 opposite sides. The pivot pin holes (15) are formed respectively in the ears  
18 (14) near the front end.

19 The bottom bracket has a front end (not numbered), two side edges  
20 (not numbered), a U-shaped recess (13), two ears (14) and two pivot pin  
21 holes (15), extends from the back plate (11) near the bottom edge and forms  
22 the bottom lip on the front surface of the back plate (11). The side edges are  
23 connected to the bottom edges of the two braces. The front end, two side  
24 edges, U-shaped recess, two ears and two pivot pin holes of the bottom

1 bracket correspond respectively to and align respectively with the front end,  
2 the two side edges, the U-shaped recess, the two ears (14) and the two pivot  
3 pin holes (15) in the top bracket.

4 The roller spaces (16) are defined between two opposite ears (14) in  
5 the top and bottom bracket.

6 The two optional hooks (12) are attached to and extend out from the  
7 rear surface of the back plate (11) and attach the suspension device to a wall  
8 (not shown) or a panel (not shown).

9 The elastic bracket (20) is made of resilient material and has a  
10 straight sheet (21) and two roller sleeves (22). The resilient material may be  
11 rubber, pliable synthetic materials or the like.

12 The straight sheet (21) has two ends (not numbered), an outer face  
13 (not numbered), multiple optional ridges (212) and multiple optional  
14 widened V-shaped grooves (214). The optional ridges (212) are defined  
15 transversely on the entire outer face and grip the handle of a tool. Optional  
16 multiple widened V-shaped grooves (214) are defined transversely at  
17 intervals on the outer face of the straight sheet (21).

18 The two roller sleeves (22) are formed respectively at the two ends  
19 of the straight sheet (21) clamped between two corresponding ears  
20 respectively in the roller spaces (16) and respectively have internal roller  
21 cavities (23) defined longitudinally in the roller sleeve (23). The roller cavity  
22 (23) has an inner surface (not numbered), multiple teeth (222) and an inner  
23 diameter (not numbered). The teeth (222) are formed longitudinally on the  
24 inner surface of the roller cavity (23).

1           The two rollers (24) are mounted respectively inside the two roller  
2 sleeves (22) of the elastic bracket (20). Each roller (24) has an axial through  
3 hole (242), an outer diameter (not numbered), an outer surface (not  
4 numbered) and multiple optional teeth (244) defined longitudinally on the  
5 outer surface. To attach the elastic bracket (20) to the hollow body (10), the  
6 axial through holes (242) in the rollers (24) mounted respectively in the  
7 roller cavities (23) are aligned with the corresponding pivot pin holes (15) in  
8 the top and bottom brackets, and the pivot pins (25) are inserted respectively  
9 into the pivot pin holes (15) and the axial through holes (242).

10           With reference to Figs. 3 and 4, a tool handle (50) is attached to the  
11 suspension device by pressing the handle (50) against the straight sheet (21)  
12 and pressing the tool handle (50) and then into the U-shaped recess (13). The  
13 roller (24) allows the roller sleeve (22) to pivot when the straight sheet (21)  
14 with the tool handle (50) is pressed into the U-shaped recess (13). Wherein,  
15 when the straight sheet (21) is compressed, the tool handle (50) overcomes a  
16 maximum deformation force, i.e. a restitution force from the deformed  
17 elastic bracket, just right at a shortest straight line between the two rollers  
18 (24), then the tool handle (50) enters the U-shaped recess (13). Hereafter, the  
19 restitution force cause from the deformed elastic bracket (20) within the stick  
20 recess (13) can not overcome the maximum deformation force at the straight  
21 line between the two roller (24). Thereby, the tool handle (50) is constrained  
22 within the U-shaped recess (13). In the U-shaped recess (13), the tool handle  
23 (50) is hold by the uneven squeezing face with multiple ridges and grooves  
24 (212, 214) surrounding around and clamped by the deformed roller sleeves

1 (22) to keep from dropping. Therefore, a user only has to enforce the tool  
2 handle (50) to enter the stick recess (13) in which the tool handle (50) is  
3 firmly secured.

4 With reference to Fig. 5, the suspension device with the two hooks  
5 (12) is attached to a wall or panel by inserting the two hooks (12) into a pair  
6 of holes (not numbered) defined through the wall or panel.

7 With reference to Fig. 6, another operational embodiment of the  
8 suspension device in accordance with the present invention does not have  
9 hooks and is slidably mounted on a track assembly (30). The track assembly  
10 (30) comprises a track (31) and two optional end plugs (33). The track (31)  
11 has two short ends (not numbered), two long hooked ends (not numbered)  
12 and an access (not numbered) defined in each of the two short ends. The two  
13 long hooked ends define two opposite slits within the track (31) to hold  
14 slidably the top and bottom lips (112) on the back plate (11). Thereby, the  
15 body (10) is movably mounted on the track (30), the position of the tool  
16 handle can be adjusted anywhere along the track (31). The two end plugs (33)  
17 are detachably mounted respectively in the two short ends to close the  
18 accesses at the short ends.

19 The suspension device for a tool handle as described has the  
20 following advantages:

21 1. The tool handle is simply pressed into the U-shaped recess (13) to  
22 clamp a tool to the suspension device. The operation of the suspension  
23 device is easy and convenient.

24 2. In cooperation with the track assembly, the suspension device

1 slides on the track to adjust the position of the tool handle in a convenient  
2 way.

3           Although the invention has been explained in relation to its preferred  
4 embodiment, many other possible modifications and variations can be made  
5 without departing from the spirit and scope of the invention as hereinafter  
6 claimed.